A COMPARATIVE STUDY ON AGILITY AND CARDIO RESPIRATORY FITNESS LEVEL AMONG PUBLIC AND PRIVATE SCHOOL GOING CHILDRENS

Dissertation Submitted to

THE TAMILNADU Dr. M.G.R MEDICAL UNIVERSITY

CHENNAI-32

Towards Partial Fulfillment of the Requirements Of

MASTER OF PHYSIOTHERAPY

DEGREE PROGRAMME

Submitted By

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The Dissertation Entitled

"A COMPARATIVE STUDY ON AGILITY AND CARDIO RESPIRATORY FITNESS LEVEL AMONG PUBLIC AND PRIVATE SCHOOL GOING CHILDRENS"

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Reg No: 271430201

Under The Guidance Of

Prof. K RAMA DEVI M.P.T (Cardio-Resp)

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Dissertation evaluated on ……**…….**

Internal Examiner External Examiner

CERTIFICATE I

This is to certify that the dissertation work entitled **A COMPARATIVE STUDY ON AGILITY AND CARDIO RESPIRATORY FITNESS LEVEL AMONG PUBLIC AND PRIVATE SCHOOL GOING CHILDRENS** was carried out by **Reg.No.271430201** P.P.G College of physiotherapy Coimbatore-35,affiliated to the Tamilnadu Dr. M.G.R. Medical university , Chennai-32, under the guidance of Prof. K Rama Devi M.P.T (Cardio-Resp)

Prof .K S RAJA SENTHIL, MPT(Cardio-Resp), MIAP, PhD

PRINCIPAL

=

CERTIFICATE II

This is to certify that the dissertation work entitled **A COMPARATIVE STUDY ON AGILITY AND CARDIO RESPIRATORY FITNESS LEVEL AMONG PUBLIC AND PRIVATE SCHOOL GOING CHILDRENS** was carried out by **Reg .No. 271430201** P.P.G College of physiotherapy Coimbatore-35 ,affiliated to the Tamilnadu Dr. M.G.R. Medical university , Chennai-32, under my guidance and direct supervision.

Prof. K .RAMA DEVI M.P.T (Cardio-Resp)

Guide

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ABSTRACT

Background of the study

A comparative study on agility and cardio respiratory fitness level among public and private school going childrens

Methodology

100 samples including both males females between 8 and 12 years of age who Fulfil inclusion criteria were selected randomly for this study. All the subjects were undergone 10x5 m shuttle run test and queens college step test to evaluate agility and cardio respiratory fitness and the data is compared between two group

Results

While comparing cardio respiratory fitness group A has a mean value pre=51.41ml\kg post=552.61ml/kg and group B has a mean value pre=57.43ml\kg post=56.79ml/kg this shows that group A better cardiorespiratory fitness level compared to group B t value=0.05, p value pre=0.068 post=0.793 shows that there is a significant difference between two groups .While comparing Agility group A has a mean value pre=27.82 second post=27.06sec group B has a mean value pre=26.46 sec post=26.18sec ,t=0.02,p value pre=1.12 post=1.07. shows that group A has Better Agility compared to group B

Conclusion

There is a significant difference between agility and cardio respiratory fitness level between public and private school going children

Key words

Agility, Cardio respiratory fitness, school going children

Cardiorespiratory fitness is the ability of the body's circulatory and respiratory systems to supply fuel and oxygen during sustained physical activity.

Agility Characterized by quickness, lightness, and ease of movement; nimble. 2. Mentally quick or alert: an **agile** mind. [French, from Latin agilis, from agere, to drive, do; see ag- in Indo-European roots.] ag′ile·ly adv.

CHAPTER – 1

1.1BACKGROUND OF THE STUDY

Cardio respiratory fitness (CRF) is a health-related component of physical fitness ACSMdefine cardio respiratory fitness as follows “cardio respiratory fitness is related to the ability to perform large muscle dynamic activities for prolonged period of time” (American college of sports medicin 2000)

Cardio respiratory fitness is a measure of how well our body is able to transport oxygen toyour muscles during prolonged exercise, and also of how well your muscles are able to absorb and use the oxygen, once it has been delivered, to generate adenosine triphosphate (ATP) energyvia cellularrespiration . Essentially, our cardio respiratory fitness level is a measure of the strength of our aerobic energy system(Ruiz et al2006)

Cardio respiratory endurance of a person is determined by a large number of factors, most important of which being age, gender, bodyweight, genotype, physical activity,acute and somepast diseases, and so on (Bouchard C, Dionne FT,1992.) . Cardiorespiratory fitness depends upon thecomponents of oxygen delivery and the oxidative mechanisms of the exercising muscle. Peak oxygen uptake(VO2 max) is recognized as the best singlecriterion of aerobic fitness(ShephardRJ, Allen C, Benade AJ, Davies CT).

A desirable level of cardio respiratory fitness provides beneficial effect onindividual physical working capacity.The improved blood,oxygen and nutritional supplyto working muscles enables the individual to work for longer period of time(Myers j ;et al 2003).

Cardiorespiratory fitness helps the cardiovascular system by improving circulation because physical activity increases a person's blood volume there by

increasing circulation.This makes iteasier for the heart to function and more blood gets to muscles, meaning more oxygen is carriedto the muscles in such a way Exercise and activity help to reduce a person's chances ofdeveloping high blood pressure, or hypertension.(Armstrong andWelsman 2006).

Maintaining an appropriate level of cardiorespiratory fitness reduces the risk of disease and increases the ability to work efficiently and to participate in and enjoy physicalactivity (Gulati M, Pandey DK, Arnsdorf MF, et al.)A high cardio respiratory fitness level has a positive impact on optimum health and prevents the onset of problem associated with inactivityat all ages.

Peak oxygen uptake strongly associated with health and disease in adulthood. Moreover, it is a strong indicator offunctional capacity and mortality inadulthood(.Brill PA, Macera CA, DavisDR, et al.)vo2max iscloselycorrelated with heart volume, vital capacity, totalbodyhemoglobin, lean body weight

Cardio respiratory endurance is very important fitness is a important indicatorover all physical health in childrencardio respiratory fitness during childhood andadolescence has been associated with a healthier cardiovascular profile during these years andlater in life (Mesa et al.2006).

Results from the Swedish and Estonian part of the EYHS (European youth heart survey)revealed negative association between cardio respiratory fitness and body fat .Thesame relationship was notedbetween cardio respiratory fitness and other features of themetabolic syndrome in children (Ruiz et al. 2006). A number of longitudinal studies have suggested that low cardio respiratory fitness during childhood and adolescences associated with later cardiovascular riskfactors, such as hyper lipidemia, hypertension and obesity.

Agility is the ability of neuromuscular system to co ordinateexplosive changes of directionand multiple body segments in all planes of motion at variable Velocities by effective use of stretch shortening cycle(Bobo.M,M.yarborough 1999). Agilityhelps in performance in activities that require us to change direction Quickly whilst keepingbalance,strength,speed and body control.Learning to become agile requires the development ofappropriate movement patterns. Children begin to develop

loco motor skills at an early agescritical periods of development occurring between 9 and 12 years of age(Drabick.J.1993) Development occur different rates and subtle gender differences exist for critical periods. A child that displays good agility will most likely possess other qualities such as, dynamicbalance, spatial awareness, rhythm, as well as visual processing. So while agility can be simplydefined as an ability to quickly stop and re-start motion, there is a high degree of complexity tothis motor skill (Jason D. Vescovi2003).

Agility is one of important topic for children because strong independent relationshipbetween agility and bone mineral content both male and female adolescents, regardless of thestage of maturation.Developing agility will provide a strong foundation for neuromuscularcontrol and motor skill function, thereby establishing overall fitness.Changing directions is a common cause of injury, so by teaching individuals proper movement mechanics we may be ableto reduce injury risk(Vicente-Rodriguez G, Jimenez-Ramirez J, Ara I, Serrano-Sanchez 2003)

Cardiorespiratoryfitness can be assessed in laboratory or field. Laboratory assessmentmay be submaximal or maximal graded exercisestress test on tread mill,bicycle or rowing.However, the availability of these specializedtesting environments is often limited to specificpatientpopulations, such as individuals with cardiac disease orathletes.Field tests providereliable and valid measure of aerobic capacity and thus provide a standardized measurementVarious field tests like step test, walk test ,shuttle run test are used in common practice(giamck 1990)There are a number of standardized tests that can be used to measure agility such as the T-test, Quadrant jump, and the Edgren Step test (Baechle, 1994)

Inadequate physical activity and physical fitness in children of all ages is a seriouspublic health problem. Regular activity sustained over several years contributes to weight control and protection from cardiovascular disease, diabetes, and other chronic diseases

Physical fitness is a tremendously important topic for school aged children today. Curriculum must stress the importance of a healthy, active lifestyle that has becomecrucial now more than ever. Schools, due to budgetary constraints, many

school districts areforced to drastically cut or completely eliminate school based physical activity program. If children learn proper physical fitness education they will build healthy habits forthe rest oftheir lives.

Studies concerning physical fitness of children had been done various countries aroundtheWorld like U.S.A,china and many European countries But in India there are only few studieshad done on the basis ofphysical fitnessin children,even thoughIndiais secondlargestPopulated countryin Kerala there is astudy conducted by educational board in the year 2009.They founded that only 14% childrenhave minimum recommended standard onfitness(TPFP report 2009)

1.2NEED OF THE STUDY

This study aims to find out the agility and cardio respiratory fitness level among public and private school going childrens

Some of the authors have given alternative explanations for this agility and cardio respiratory fitness level

In the presence of so many conflicting evidences clinical decision making becomes tough & arbitrary. There is a need for more studies aimed at exploring the efficacy of this approach to standardize the treatment based on scientific evidences; this led to think of doing such a study

1.3 AIM OF THE STUDY

A comparative study on agility and cardio respiratory fitness level among public and private school going children's

1.4OBJECTIVES OF THE STUDY

- To find out the agility and cardiorespiratory fitness level among public school going children.
- To find out the agility and cardiorespiratory fitness level among private school going children
- To comparative study on agility and cardio respiratory fitness level among public and private school going children's

1.5HYPOTHESIS

Alternate Hypothesis

There would have been significant difference in agility and cardio respiratory fitness level between private and public sector students

Null Hypothesis

There would have been significant difference in agility and cardio respiratory fitness level between private and public sector students

1.6 OPERATIONAL DEFINITION

The noun agility can be used for both mental and physical skills in speed and grace. Your mental agility might allow you to follow both conversations at once. Or your brother's soccer prowess shows in his physical agility. The word agility does not have to be applied to human abilities, however: "The sailboat's agility in the water made it the perfect craft for racing."

Bloomfield, Acldand& Elliot

Agility or nimbleness is the ability to change the body's position efficiently, and requires the integration of isolated movement skills using a combination of balance, coordination, speed, reflexes, strength, and endurance. Agility is the ability to change the direction of the body in an efficient and effective manner and to achieve this requires a combination

Barrow & McGee

Cardiorespiratory fitness is the ability of the body's circulatory and respiratory systems to supply fuel and oxygen during sustained physical activity.

Donatello, Rebeka J

Cardiorespiratory refers to the ability of the circulatory and respiratory systems to supply oxygen to skeletal muscles during sustained physical activity. Regular exercise makes these systems more efficient by enlarging the heart muscle, enabling more blood to be pumped with each stroke, and increasing the number of small arteries in trained skeletal muscles, which supply more blood to working muscles. Exercise improves the respiratory system by increasing the amount of oxygen that is inhaled and distributed to body tissue.

Pollock, M.L.Gaesser

CHAPTER – II

REVIEW OF LITERATURE

1.**Krahenbuhl GS, 1985,in the study**" Developmental aspects of maximal aerobic power in children", points that cardio respiratory fitness is an important indicator ofoverall physical health in children and young people.

2.Shephard RJ .in astudy "The maximum oxygen intake. An international reference standard of cardio respiratoryfitness" says that The maximal oxygen consumption (VO2max) attained during a gradedmaximal exercise to voluntary exhaustion has long since been considered by the World HealthOrganization as the single best indicator of cardio respiratory fitness.

3. Zuluaga, M., Briggs, C. and Carsile, in the" book Sports Physiotherapy AppliedScience andPractice*"* 1995 points that an above average Vo2 max score indicates a healthy level ofcardio respiratoryfitness and that an individual is fit to cope with the general demands of living.

4.Anderson G.S ,1991 in a study titled "The 1600 m run and multistage 20 m shuttle run as predictive tests of aerobic capacity in children" says that The assessment of cardio respiratoryfitness in children and adolescent has been growing in importance because several data link theVO2 max with CVD risk factors

5.Anderson et al in his study" Childhood fitness and clustering of cardiovascular disease risks"2006 says cardio respiratory fitness is strongly associated with the clustering of CVDrisk factors in children and youth, and that the association is independent of country, age andsex.

6.**Guerra** et al. in his study "Relationship between cardio respiratory fitness,bodycompositionand blood pressure in school children"(2002) showed that boys had greater VO2max incomparison to girls.

7.Pate RR, Wang CY, Dowda M, Farrell SW, O'Neill JR in there survey. "Cardio respiratoryFitnesslevels among11 to 19 years of age "shows thatOverweight adolescents exhibit lowerCardio respiratory fitness than their normal weight peers.

8. McArdle, W.D.,Katch, I.F. andKatch,L.V.: in the study "Energy, Nutrition and HumanPerformance". 2001 points that Queen's college step test is a standard method to measure one's maximal oxygen uptake using bench stepping sub maximal exercise, suitable for both sexes.

9. Chatterjee et al in the study "validity of queens college step test for use in young Indian men" 2001 Says that queens college step test is simple inexpensive and valid method for assessing vo2max.

10. Tokmakidis SP, Kasambalis A, Christodoulos AD. In there study "Fitness levels of Greekprimary schoolchildren in relationship to overweight and obesity"2006. show that there is anegative correlation between the body mass index (BMI) and cardio respiratory fitness level.

11.Dr G Sandercock and colleagues at the University of Essex in a study published in Archives ofDisease in Childhood,2009 suggests a decline in the cardio respiratory fitness of English 10year-olds children from 1998 to 2008. This decline in fitness appears to be independent tochanges inBMI,

12.Xiang shenet al In a study "The association of weight status with physical fitness in Chinesechildren",2010 showed that the overweight and obese children performed worse in cardio respiratory fitness, muscle explosive strength, and agilty compared with normal weight children

13.Lisa merceron her report onChildren's speed and agility training programs,2011. Suggest thatagility should develop at age appropriate stages that children between the ages of 5 and 8 shouldbe exposed to a variety of movement patterns, which include arm and leg movements performedfrom a stationary position,

jumping moves and exercise that promote spatial awareness. Skill mastery is enhanced between ages 9 and 13.

14.Kyle Brown on his study" agility training for sports specific result" 2011 states development of Agility improves quickness,reaction time,acceleration, proprioception,co-ordination balance, and Moreover, as it strengthens the muscles and tendons of all major joints it will aidin preventing injuries by improving body control through repetition of proper movementmechanics.

15. Drabik, J. in study Children & Sports Training: How Your Future Champions ShouldExercise to be Healthy, Fit, and Happy.1996 says that critical periods of developmentoccurring between 9 and 12 years of age.

16.Avery D. Faigenbaumet al in his study Effects of a short-term plyometric and resistancetraining program on fitness performance in boys age 12 to 15 yearsstates that improvements inmuscular fitness and speed/agility, rather than cardio respiratory fitness,seem to have a positiveeffect on skeletal health;

17.C Riddoch, J M Savage, N Murphy, G W Cran, C Boreham;1991 in the study titled "long term health implications of fitness and physical activity patterns" pointed that shuttle run testsare reliable method for assessing agility in children

18. Lisa Ditrichin her article "About challenge";2011 submittedto presidents council of sports andfitness points that The shuttle run test is primarily measures the child's speed and agility andworks well on a gym floor or other favorable surface..Exercise and Physical Activity Guide for Health Promotion 2006.Under Ministry of Health,Labour and Welfare of Japan; 2006. States that physical activity refers to any bodily movement produced by skeletal muscles that increases energy expenditure above a basal level .It can divided into two categories one is exercise and other is non exercise physical activity

19.Heidi Bates,2006 in a report written about importance of daily physical activity for childrenstates that "Regular physical activity is recognized as a key determinant of

healthand wellness. Strong evidence indicates that low levels of physical activity are linked with low fitness level inchildren”

20.Brownson, R.C., Boehmer, T.K. and Luke, D. A. (2005) in there research report” Decliningrates of physical activity in the United States:what arethecontributors” points that Datafrom several recent studies indicate a progressive decrease in physical activity and a parallel decrease in aerobic performance in children and adolescents

21.Morrison, J.A. and C.J. Glueck.1991 in study” Pediatric risk factors for adult coronary heartdisease: Primary atherosclerosis prevention”. States that regular physical activity will resultin significant gains in aerobic fitness in children, particularly those who are prepubescent.

22.Chidambararaja (1992) conducted a study to investigate the effect of continuous running and interval running on cardio respiratory endurance, speed, agility and muscular endurance. The criterion variables chosen namely cardio respiratory endurance was measured by cooper’s 12 minutes run/walk test, speed was measured by 50 meter run, agility was measured by 4 ×10 shuttle run and muscular endurance was measured by number of sit-ups per minutes .the findings of the study showed that the both the training groups improved the cardio respiratory endurance 22 and muscular endurance. Since the interval running improves the performance rapidly that of continuous running. The interval running group showed a significant difference when compare to continuous running and control group on selected criterion variables.

23.Vaithianathan (1998) conducted a study to investigate the effect of training and after on selected physical and physiological variables. The criterion variables chosen namely muscular strength was measured by pull-ups, muscular endurance was measured by sit-ups, cardio respiratory endurance was measured by cooper’s 12 minutes run/walk test, blood pressure was measured by stethoscope, vital capacity was measured by spirometer and respiratory rate was measured by stethoscope. The findings of the study showed that the circuit training improved the efficiency significantly in physical fitness variables.

24.Amusa (1999) selected forty six college soccer players tested for running speed, agility and vo2 max. Soccer playing ability served as a criterion variable was measured by the rating of three experienced soccer coaches based on certain soccer skill and strategies. Vo2 max running speed and agility were considered important factor in soccer performance.

25.Roy (1994) conducted a study on the strength and muscular endurance of soccer players. The criterion variables strength was measured by push- ups, pull- ups and muscular endurance was measured by sit-ups. The findings of the study showed that the defensive soccer players were superior to the forwards in strength and muscular endurance.

Total physical fitness program[TPFP] program under Tamilnadu government reported that Only **14** percent of state school populationfrom classes' five to ten found within the minimum recommended standard on all the health related physical fitness test items

CHAPTER – III

3.1 STUDY DESIGN

Comparative study

3.2 STUDY SETTING

PARK GLOBAL SCHOOL,KALAPATTI
LISIEUS MATRICULATION HIGER SECONDARY SCHOOL
MOUNT LITEA ZEE SCHOOL
LITTIL FLOWER CONVENT MATRIC HIGER SECONDARY SCHOOL

3.3 SAMPLING SIZE

100 subjects randomly selected from the age group of 6-12 yrs. 50 subjects from public school going and 50 from privet school going children's

3.4 SAMPLING TECHNIQUE

100 samples were randomly selected from population fulfilling inclusion criteria subjects were taken divided into 2 groups age group of 10 to 12
PUBLIC SECTOR BOYS AND GIRLS-GROUP A
PRIVATE SECTOR BOYS AND GIRLS-GROUP B

3.5 STUDY DURATION

1 month

3.6 SECTION ORIENTATION

INCLUSION CRITERIA

- Age from 10 to 12
- Both sexes
- Able to follow commands
- Children with normal BMI- (BMI >18.50 &<= 24.99)

EXCLUSION CRITERIA

- Children with cardio respiratory problem
- Children with any orthopedic problem of lower limb
- Children with fractures
- Children with any sensorymotor deficit
- Children who receiving any sports specific training
- Mentally retarded children

3.7 MATERIALS

Wooden step, Stop watch, measuring tape, marker cones, a flat non-slip surface

3.8 PROCEDURE

100 children were randomly selected on the basis of inclusion and exclusion criteria. The study procedure was explained to subjects and their parents , and informed parental consent is obtained prior testing. Initially BMI of the children assessed usingAvron BMI unit children with normal BMI are selected as samples.

For assessing cardio respiratory fitness queens college step test was used subject was asked step on a 16.25inch wooden step continuously for 3 minutes .a metronome was used to monitor the stepping cadence, which was set at 88 beats per minute for females and 96 beats per minute for males.After completion of test, subjects remained standing while pulse rate was measured for 15 seconds, 5to 20

seconds into recovery. Recovery heart rate was converted to beats per minute and recorded .after 20 min of recovery period agility was assessed.

Agility was assessed using 10x5 m shuttle run test in this marker cones are placed 5m apart. Subject asked to Start with a foot at one marker. When instructed by the examiner, the subject runs to the opposite marker, turns and returns to the starting line. This is repeated five times without stopping. Time require for completing this test is measured using stopwatch in seconds and recorded.Aglity test was assessed two times before and after step test and values are compared with other group

CHAPTER – IV

DATA ANALYSIS

Data collected are scores of queens college step test and 10*5 shuttle run test. Data was analyzed using Statistical package for the social sciences[SPSS] 12.0.T test was use to check the difference between two groups

With group analysis of group A (experimental)

Agility

TEST	MEAN	SD	P	T
Pre	27.82	1.53	1.47	
Post	27.06	1.65	1.41	0.059

With group analysis of group A (experimental)

Vo2 Max

TEST	MEAN	SD	P	T
Pre	51.41	10.93`	0.65	
Post	52.61	10.34	0.12	0.012

With group analysis of group B (Control)

Agility

TEST	MEAN	SD	P	T
Pre	26.46	2.19	1.12	
Post	26.18	2.13	1.07	0.02

With group analysis of group B (Control)

Vo2 Max

TEST	MEAN	SD	P	T
Pre	57.43	13.52	0.068	
Post	56.79	11.99	0.793	0.005

Comparison between group A Agility and group B Agility

Agility

Test	Group	Mean	SD	P	T
Pre	Control	27.82	1.53	1.47	0.08
	Experimental	26.46	2.19	1.12	
Post	Control	27.06	1.65	1.41	0.06
	Experimental	26.18	2.13	1.07	

Comparison between group A Vo2 Max and group B Vo2 Max

Vo2 Max

Test	Group	Mean	SD	P	T
Pre	Control	51.41	10.93	0.65	0.05
	Experimental	57.43	13.52	0.068	
Post	Control	52.61	10.34	0.12	0.04
	Experimental	56.79	11.99	0.793	

RESULTS

This study compared cardio respiratory fitness and agility level between public school going children (group :A) and private school going children(group:B).while comparing cardio respiratory fitness group A has a mean value pre 51.41 ml\kg post 52.61ml/kg and group B has a mean value pre 57.43ml\kg post 56.79ml/kg this shows that group A better cardio respiratory level compared to group B t value=0.05, p value=0.793 shows that there is a significant difference between two groups.

While comparing two sets of agility test group A has a mean value pre=27.82sec ,post=27.06 sec and group B has a mean value pre=26.46sec post=26.18 this shows that group A performed bitterly in agility test compared to group B, t value=0.02,p value pre=1.12,post=1.07 shows that there is a significant difference between two groups.

CHAPTER - V

DISCUSSION

This comparative study was done to asses agility and cardio respiratory fitness level among Public sector and private sector school going children. Overall results shows that there is a Significant difference in agility and cardio respiratory fitness level between public and public school going children. While comparing cardio respiratory fitness public sector students have mean value and private sector students have mean value 54.42.while comparing agility public sector students shown a mean value of 27.14sec and private students show a mean value of 26.82sec so we can say Public sector school going children demonstrated higher level of cardio respiratory fitness and agility than private school going children.

This study had only taken children of age ranging from 10 to 12 because below the Age of 10 children will have high cardio respiratory ceiling so we cannot find significant difference in cardio respiratory fitness among children of both sex to exclude this physiologic factor this study excluded children below ten years . Physiologically agility develop only after 9 years so its better to test agility after 9 years .This study also excluded children above 12 years because in boys after puberty there is a significant increase in vo2 max in due to effecttestosterone. In girls after puberty due to hormonal influence there increase accumulation of fat in the body which has a negative effect in Vo2 max value .Present study also exclude obese children because several study has already proved that there is a inverse relationship between obesity with agility and cardio respiratory fitness. Present study is only selecting children doing moderate non exercise physical activity .children who are performing regular vigorous and lowphysical activity are excluded from study to eliminate there effect on physical fitness .So present study only selecting the children capable of building good physical fitness because no extraneous factors like obesity, low physical activity and other physiological factors affecting them.

Similar other study done in Tamilnadu state initiated by government of Tamilnadu as a part of total physical fitness program 2009 founded that majority of school going children in Tamilnadu have fitness level below the recommended standards. This study only tested health related components of fitness .This study has many draw backs comparing to present study majority of children included in this study are only from government and aided schools private school going children are mostly excluded from this study .While testing cardio respiratory fitnessthey used 1 mile run test in which they took time taken by the child to complete one mile run is taken as outcome measure .Present is taking VO2 max as a outcome measure to test cardio respiratory fitness . According to W.H.O Peak oxygen uptake (VO2 max) is recognized as the best single criterion measure of aerobic fitness. Another drawback of that study that they are blindly selecting all the children for the study no inclusion and exclusion criteria are considered.Another drawback of that study is they are comparing school going children of Tamilnadu with Japanese children who are following totally different life style while comparing to our students. Present study has proper inclusion and exclusion criteria and comparison is made between Public and private school children.

Another similar study done to asses health related fitness of south African Children conducted by L.O Amusa ;et al 2011 who assessed health related fitness using EUROFIT And AAPHERD test .This study also only assessed public school children of age Group 9 to 12 they excluded Private school going children. This study also used 1mile run test. Test cardio respiratory fitness. In this study they concluded that Physical fitness of that school children seems to be low, thus confirming the worldwide decline in fitness levels of children.

Present study has several limitations. This study has limited sample size and covered only a peculiar geographic area .this study only assessed two components of physical fitness. This study not explored relationship between geography, socioeconomic status, nutrition, genetics with physical fitness. Important limitation is this study is not exploring actual cause for decline inphysical fitness .

There are scarcity of studies regarding physical fitness of children more studies need to fill the lacuna .Cross-sectional studies of children are important to identify baseline values for outcome measures related to physical fitness. Identification of laboratory, clinical, and field tests that are responsive to interventions is needed. Quality assurance is essential .reliable and standardized procedures must be developed.

CHAPTER - VI

SUMMARY

There is a significant difference between agility and cardio respiratory fitness level between public and private school going children

CONCLUSION

Within the limitations of the present study, it is concluded that there is a significant difference between agility and cardio respiratory fitness level among public and private school going children. While comparing cardio respiratory fitness group A has a mean value pre=51.41 ml\kg post=52.61ml/kg and group B has a mean value pre=57.43ml\kg post=56.79ml/kg this shows that group A better cardio respiratory fitness level compared to group B t value=0.05, p value pre=0.068 post=0.793

CHAPTER - VII

LIMITATIONS

While comparing between the fitness studies it shows that there is a limit for some patients like mentatlly retarded, physicalydisabled ,asthmatic patients ,childhood pneumonia patients , and children in congenital heart diseases like ASD VSD, tetrology of fallot which terribly effect them.

SUGGESTIONS

- All children should engage in physical activities that promote cardio respiratory fitness and Musculoskeletal fitness.
- Children and adolescents should be permitted and encouraged to participate in enjoyable physical activities
- physical activities that total at least 60 minutes per day, on most days. Most of these activities should be of moderate intensity so that heart rate and breathing rate are increased.
- Children should engage in more vigorous activity on at least three days per week, where heart rate and breathing rate are increased even more.

- Children should have the opportunity and be encouraged to participate in traditional sports and games.

- In addition to organized sports, children should have the opportunity and be encouraged to participate in leisure activities such as walking, jogging, swimming, cycling, and skating.

CHAPTER - VIII

REFERENCES

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CHAPTER - IX

APPENDIX-1

CONSENT FORM

Institution Name and Address: Department of physiotherapy,
PPG College of Physiotherapy

Name of Researcher : AKHIL RAHIMAN.N
Title of the study : Comparative study in Agility and Cardio respiratory fitness level between Public and Private school children
Phone No : 09447437997

I……..… agree, My child's (…….) participation in the research conducted by Mr.AKHIL RAHIMAN.N for the partial fulfillment of her Master of physiotherapy programme of the Department of Physiotherapy,PPG College of physiotherapy,Coimbatore. The project is under the Supervision of Prof.K S Raja SenthilMPT(Cardio-Resp) MIAP.Phd. The purpose of the study is to compare Agility and Cardio respiratory fitness between Public and private school going children.

My child's participation will consist of evaluation of cadio respiratory Fitness and Agility using Queens college step test and 10x5 m shuttle run test. I understand that evaluation consists of no danger and precaution will be taken to avoid this. I am free to withdraw my child's participation at any time before or during the evaluation and, to refuse to participate in the research.

I had received assurance from the researcher that the information shared by my child will remain strictly confidential. Anonymity will be assured by not using any name in any type of publication.

These are two copies of this content from one of which I may keep. If I have any questions about the conduct of the research project I may contact the researcher at any time.

Researcher's Name :AKHIL RAHIMAN.N
Respondent Signature

Official Address :Department of Physiotherapy
PPG College of physiotherapy
Coimbatore

APPENDIX-2

SCALES AND TOOLS

Queens College Step test

The Queens College Step test is one of many variations of step test procedures, used to determine aerobic fitness.

purpose: this sub-maximal test provides a measure of cardiorespiratory fitness
equipment required: 16.25 inches / 41.3 cm step, stopwatch, metronome

procedure: The athlete steps up and down on the platform at a rate of 22 steps per minute for females and at 24 steps per minute for males. The subjects are to step using a four-step cadence, 'up-up-down-down' for 3 minutes. The athlete stops immediately on completion of the test, and the heart beats are counted for 15 seconds from 5-20 seconds of recovery. Multiply this 15 second reading by 4 will give the beats per minute (bpm) value to be used in the calculation

scoring: an estimation of VO2max can be calculated from the test results, using formula

- *Boys:* VO2max (ml/kg/min) = 111.33 - 0.42 x heart rate (bpm)
- *Girls:* VO2max (ml/kg/min) = 65.81 - 0.1847 x heart rate (bpm)

10x 5 m Agility Shuttle Run

purpose: This is a test of speed an agility

equipment required: stopwatch, measuring tape, marker cones, a flat non-slip surface

procedure: marker cones and/or lines are placed five meters apart. Start with a foot at one marker. When instructed by the timer, the subject runs to the opposite marker, turns and returns to the starting line. This is repeated five times without stopping (covering 50 meters total). At each marker both feet must fully cross the line.

scoring: Record the total time taken to complete the 50 m course

APENDIX -3

DATA COLLECTION FORM

Name :

Age :

Sex :

Guardians Name :

Hieght(cm) :

Wieght (kg) :

BMI :

Physical Activity Level :

Queens College step test score(ml\kg) :

10x5 Agility shuttle run test score(sec)before and after step test :